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Equipment Specifications for Tray Display of Produce in Retail Stores

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U.S. DEPARTMENT OF AGRICULTURE
Agricultural Marketing Service
Marketing Research Division
Washington, D.C.

PREFACE

The study on which this preliminary report is based is part of a larger research project to improve the operations of retail produce departments. The equipment specifications for the tray display system reported on here were developed to meet the needs of one large firm. This equipment is now being evaluated and modified in a number of additional firms. Results of this additional research will be made available when completed. The work is under the general supervision of R. W. Hoecker, head, Wholesaling and Retailing Section.

Acknowledgment is made to the Penn Fruit Co. of Philadelphia, Pa., for assistance in conducting the tests, and to Mr. Jack Cohen of the K. M. S. Bruce Co., Philadelphia, Pa., for his assistance in designing and constructing the equipment.

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EQUIPMENT SPECIFICATIONS FOR TRAY DISPLAY OF PRODUCE IN RETAIL STORES

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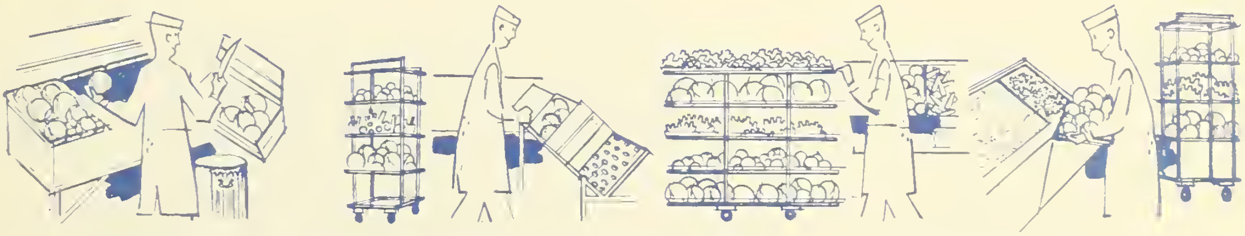
INTRODUCTION

An article entitled "Displaying Fresh Produce in Retail Stores" published in the December 1957 issue of Agricultural Marketing summarized preliminary results of research on the tray method of displaying produce. The article indicated some of the potentialities of this method of retailing produce.

As a result of industry interest in this method of retailing produce, preliminary specifications were developed for the equipment currently being used by the cooperators. The purpose of this report is to make available these specifications as well as some of the considerations in the development and use of the equipment.

The new equipment is a combination of large tray-type handling units that can be filled with produce in the back room, hauled on a carrier rack to the floor, then placed directly on the display counters (fig. 1). The new work methods and procedures are designed to make maximum use of equipment and labor to overcome such typical produce department problems as getting displays set up early each morning, maintaining ample counter stock during peak sales periods, rotating and culling counter stock, minimizing congestion and litter in the sales area, and the removal of highly perishable counter merchandise for overnight cooler storage and reprocessing.

To meet the requirements of the tray method of display the present counters were modified, display trays, tray carriers, work places, and special bins for handling bulky, large volume items were developed. Schematic drawings of the equipment are included in this report.



IMPROVED EQUIPMENT AND WORK PROCEDURES FOR DISPLAYING FRESH PRODUCE

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Figure 1.

DISPLAY COUNTERS

Research work to date in the development of tray-type equipment for produce retailing has been conducted primarily in one-floor bulk and prepack produce departments ranging in sales volume from $4,000 to $10,000 weekly. Each of the test departments was equipped with in-line wall and gondola counters with a plain stainless steel facia along the front of the display surface (no glass or metal framing on the top edge of the facia). Crushed or flaked ice beds were used for refrigerating displays of certain items. Counter sizes ranged from 36 to 42 inches in width, but were held the same size in each individual store. The counters were modified using the counter liners shown in figures 2 and 3.

Two trays in tandem arrangement (one behind the other), as shown in figure 4, were used on both dry and wet counters in the test stores. Since the pan-type and wire mesh trays used in these stores were approximately the same size, all display spaces were of uniform size and item display locations could be shifted very easily.

The two-tray arrangement has certain advantages over the use of a single tray large enough to cover the full width of the counter, particularly where counters are wider than 36 inches. Long narrow trays were found to be more difficult to handle. Wide doorways and passages are required in order to move the long trays through the department on tray carriers. Also, a larger quantity of old merchandise must be handled piece by piece each time the display is restocked, as is explained in the description of restocking procedure. However, it appears that in smaller volume departments and those having counters less than the 36-inch width of those in test stores, the best choice may be the single full-width tray.

The use of two trays in tandem to cover the counter width offers considerable flexibility in display size and arrangement and in the procedure used for rotating and restocking displays. Different items can be displayed in the front and rear trays. This is called a "checkerboard" display arrangement. Although contrary to the ribbon pattern most widely used in displaying produce, the checkerboard pattern has been employed by the cooperating firm for some time prior to the research. The seasonal items and advertised specials were often given four tray spaces. Single tray displays in checkerboard arrangement were usually restricted to high-priced fruits and vegetables.

TRAYS

Several types and sizes of trays were tested in the course of the study. The findings indicated that the following factors should be considered in selecting a tray of the size and design best suited for a particular produce department.

1. Adaptability of the tray size to the dimensions of the display counters, the variety of items to be displayed, and the total amount of display space available to the department.

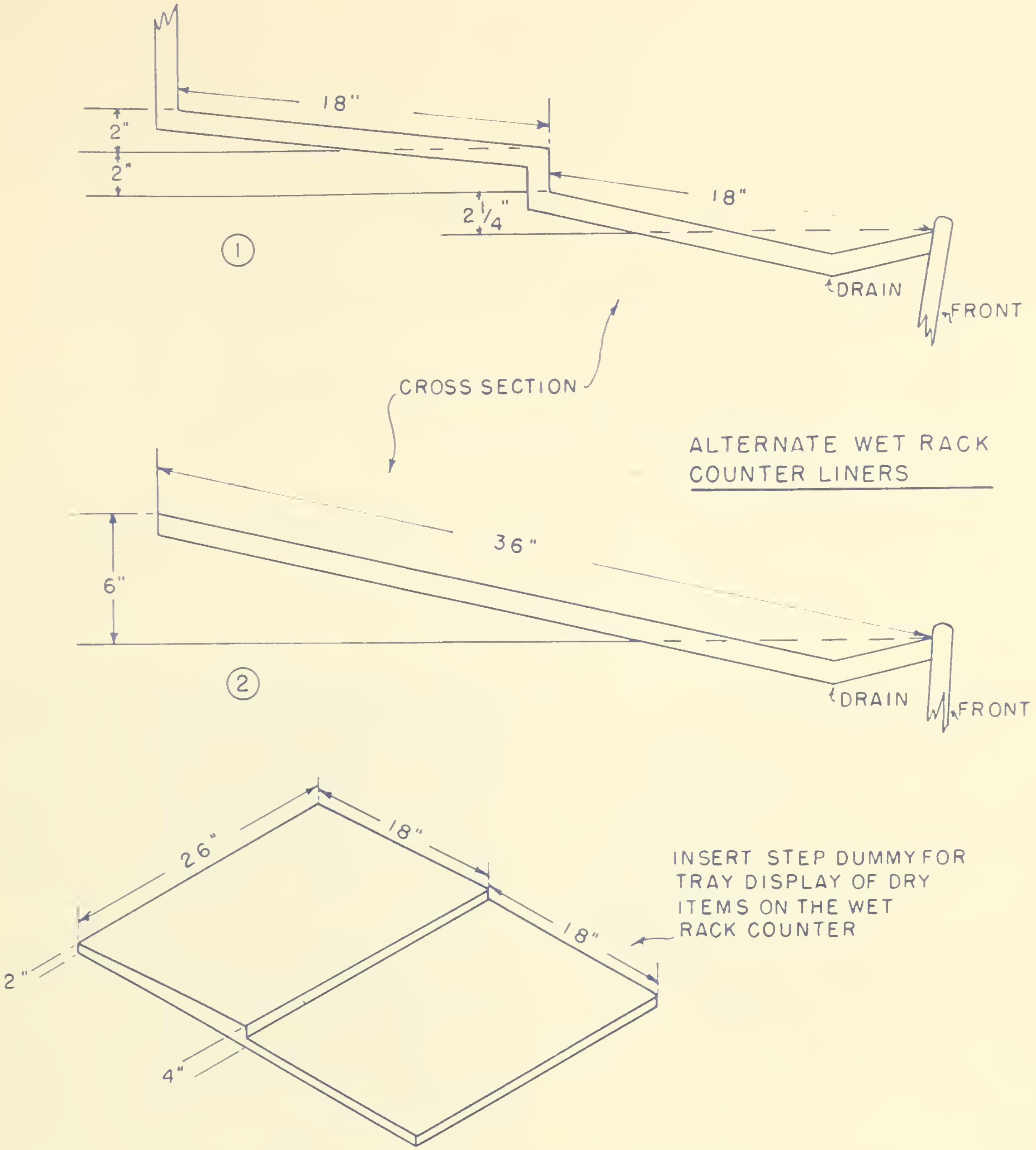
18"
2"
2"
18"
2 1/4"
①
DRAIN
FRONT
CROSS SECTION
ALTERNATE WET RACK COUNTER LINERS
36"
6"
②
DRAIN
FRONT
26"
18"
18"
2"
4"
INSERT STEP DUMMY FOR TRAY DISPLAY OF DRY ITEMS ON THE WET RACK COUNTER

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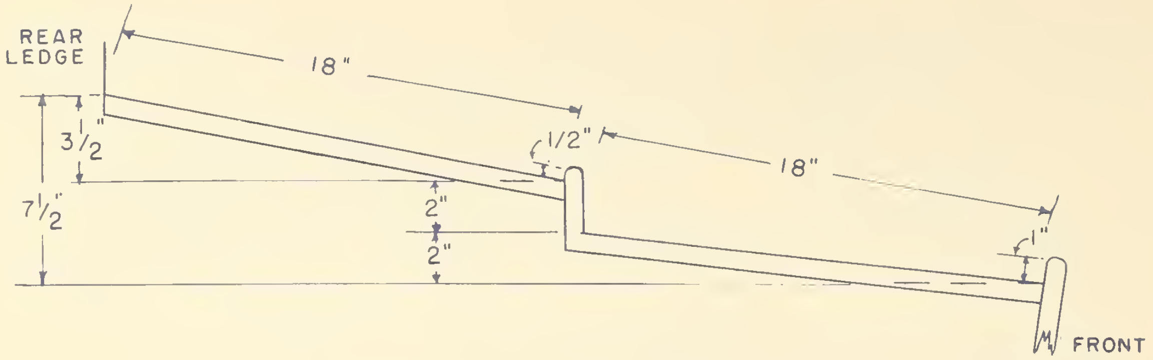
Figure 2.

2. A combination of length and width dimensions that will accommodate most produce items or packages in an orderly arrangement of pleasing appearance. For example, if it is desired to display stalks of celery parallel to the length of the counter a minimum width of 13-1/2 inches is required for each row. Trays wider or narrower than 13-1/2 inches would require a different arrangement of celery in the tray.



DRY RACK COUNTER LINER

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Figure 3.

TRAY ARRANGEMENT FOR DISPLAY

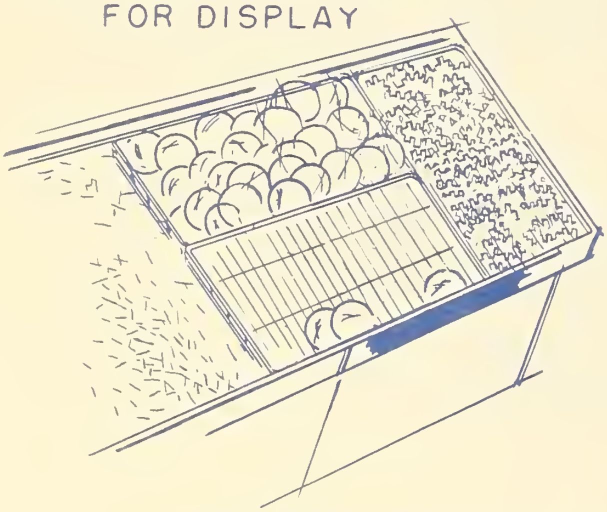

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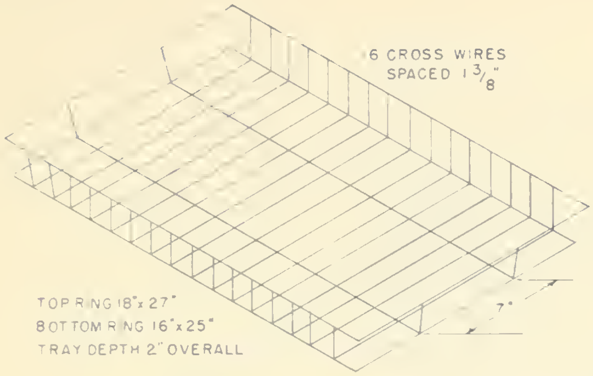
Figure 4.

3. An overall size and loaded weight that can be easily lifted and manuevered by the personnel who will be expected to handle filled trays. Tests of various tray sizes indicate that those having an area larger than 500 square inches are awkward to handle, and if loaded to capacity, will be too heavy for continuous one-man handling.

4. Ability to nest the trays one in the other when empty is an important space-saving feature.

5. The design of trays and the materials used in their construction should provide for durability and pleasing appearance. The dimensions of the wire tray used for wet rack produce is shown in figure 5.

In addition to the trays for wet rack produce, commercial bakery bun pans (26 x 17-1/2 x 3/4 inches) made from either sheet metal or fiberglass, and custom-made half-size trays (18 x 13 x 2 inches) of metal or plastic material, were employed in the study. The half-size trays were used continuously in the same counter location for display of small volume varieties of onions and squash. Half-size trays were also used for displaying parsley, dill, watercress, and pot herbs. Appropriate modification of the basic tray size and related equipment will be necessary in order to adapt the tray method of display to departments equipped with counters narrower than 36 inches. Also those differing in other respects from the test stores.



WIRE TRAY FOR WET RACK PRODUCE

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Figure 5.

TRAY CARRIERS

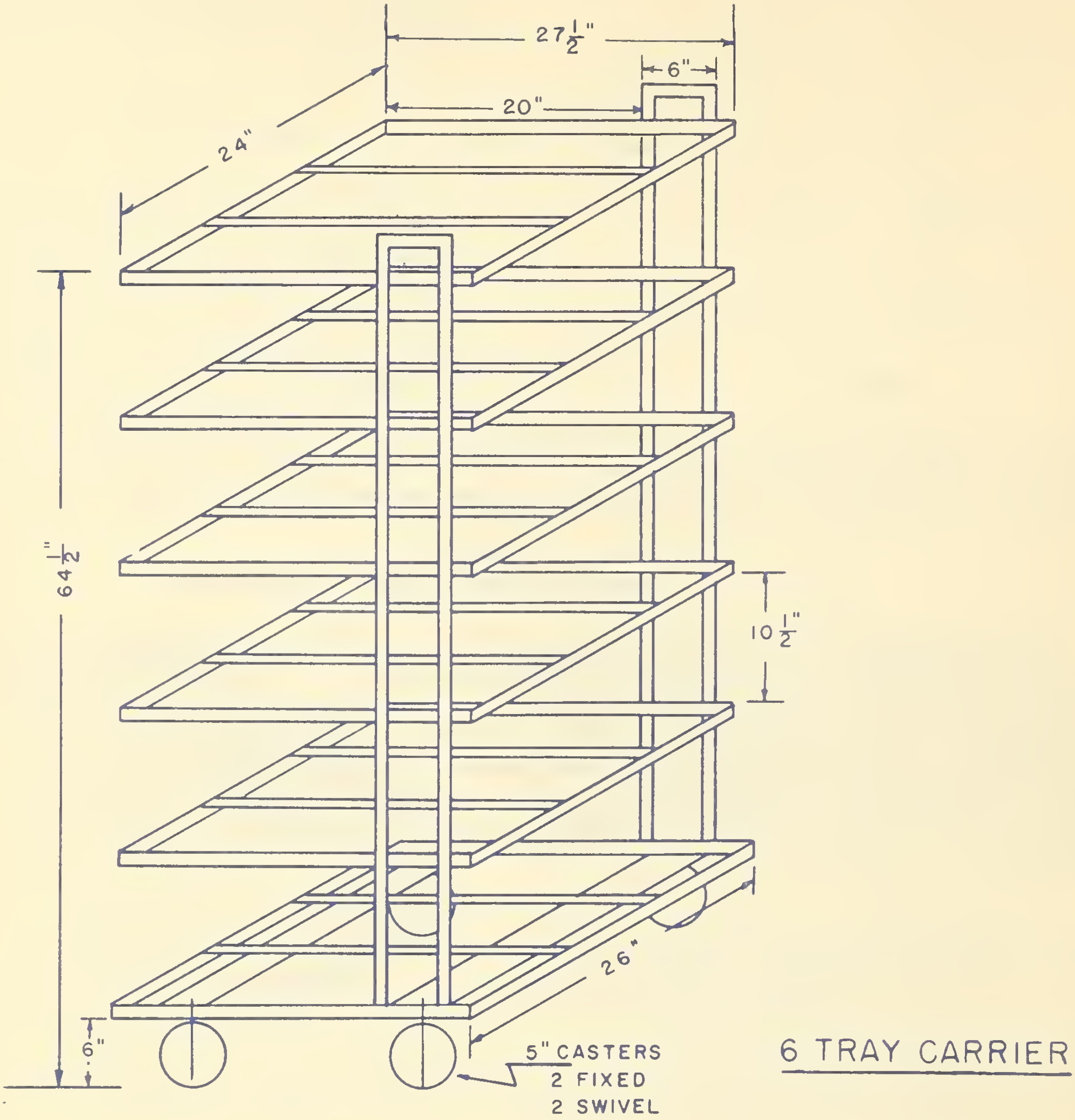
Carriers for transporting trays from the back room to the display counter and for use in storing the trayed merchandise in the coolers were developed in 6-, 12-, and 18-tray sizes. Drawings of this equipment are shown in figures 6, 7, and 8. The 18-tray carrier is used for setting up and taking down the produce at times when it will not interfere with customer traffic; and for storing trayed merchandise in the cooler. The smaller size carriers are used for restocking merchandise in the smaller produce departments.

WORKPLACE FOR TRIMMING PRODUCE AND FILLING TRAYS

The recommended layout and equipment for an efficient workplace for trimming is described in Marketing Research Report No. 192, "Improved Methods of Trimming Produce in Retail Food Stores." In order to adapt this recommended workplace for tray operation, a wall-mounted or over-the-sink rack (fig. 9) for holding trays being loaded, and a conveniently located storage shelf for empty trays, are the only additional pieces of equipment required. One of the multiple-tray carrier racks is parked alongside the workplace to receive filled trays.

When grading into two price groups was required, two trays were positioned side by side on the tray holding rack and trimmed items were placed on one of the two trays according to the size and price. Prepriced paper-wire ties were placed on all trim items except corn. By combining the operations of trimming, grading, and pricing as described, it is possible for the product to be handled only one time from shipping container to display counter. This procedure expedites the handling of trim merchandise and reduces bruise damage through repeated handlings. Wire mesh trays were used exclusively for trim merchandise.

The design and dimensions of workplaces for a bulk-type traying operation, where only a limited amount of prepackaging will be done, are shown in figures 10 and 11. The container holder with collar and tray storage racks shown in figure 10 are positioned on the left side of the traying table's work surface (fig. 11). One of the container holders (model A) is designed as a stationary piece of equipment and the other (model B) rests on fixed casters with shelf space provided for mounting a scale. Model B should be provided at one work station if it is planned to perform occasional weighing and pricing operations in the produce back room. The casters make it possible to move the assembly forward for easy access to the scale when it is being used. The equipment



(NOTE: THIS DRAWING SHOWS ONLY CONFIGURATION AND DIMENSION)

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Figure 6.

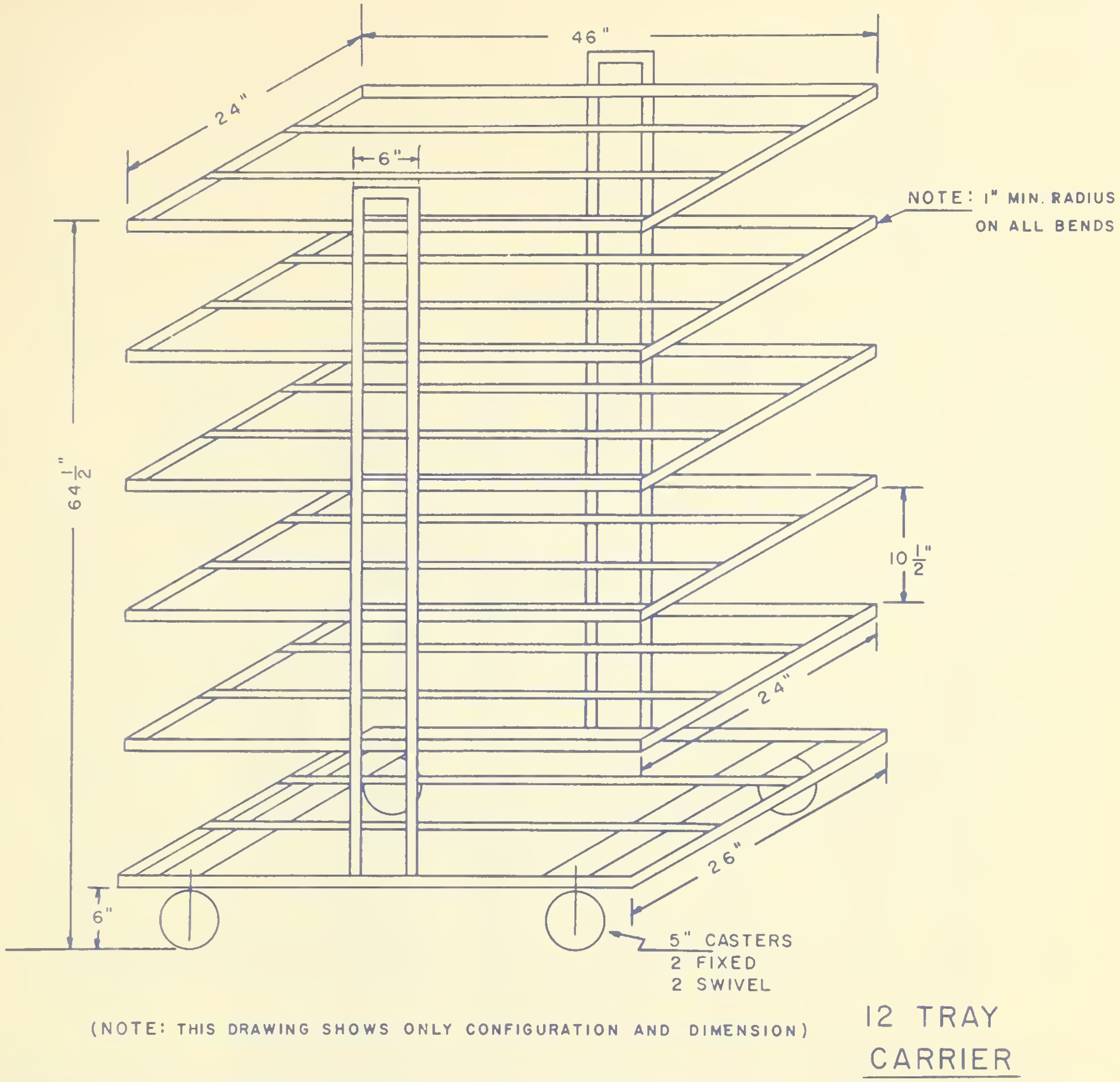
46"
24"
6"
NOTE: 1" MIN. RADIUS ON ALL BENDS
64 $\frac{1}{2}$"
10 $\frac{1}{2}$"
24"
26"
6"
5" CASTERS
2 FIXED
2 SWIVEL
(NOTE: THIS DRAWING SHOWS ONLY CONFIGURATION AND DIMENSION)
12 TRAY CARRIER

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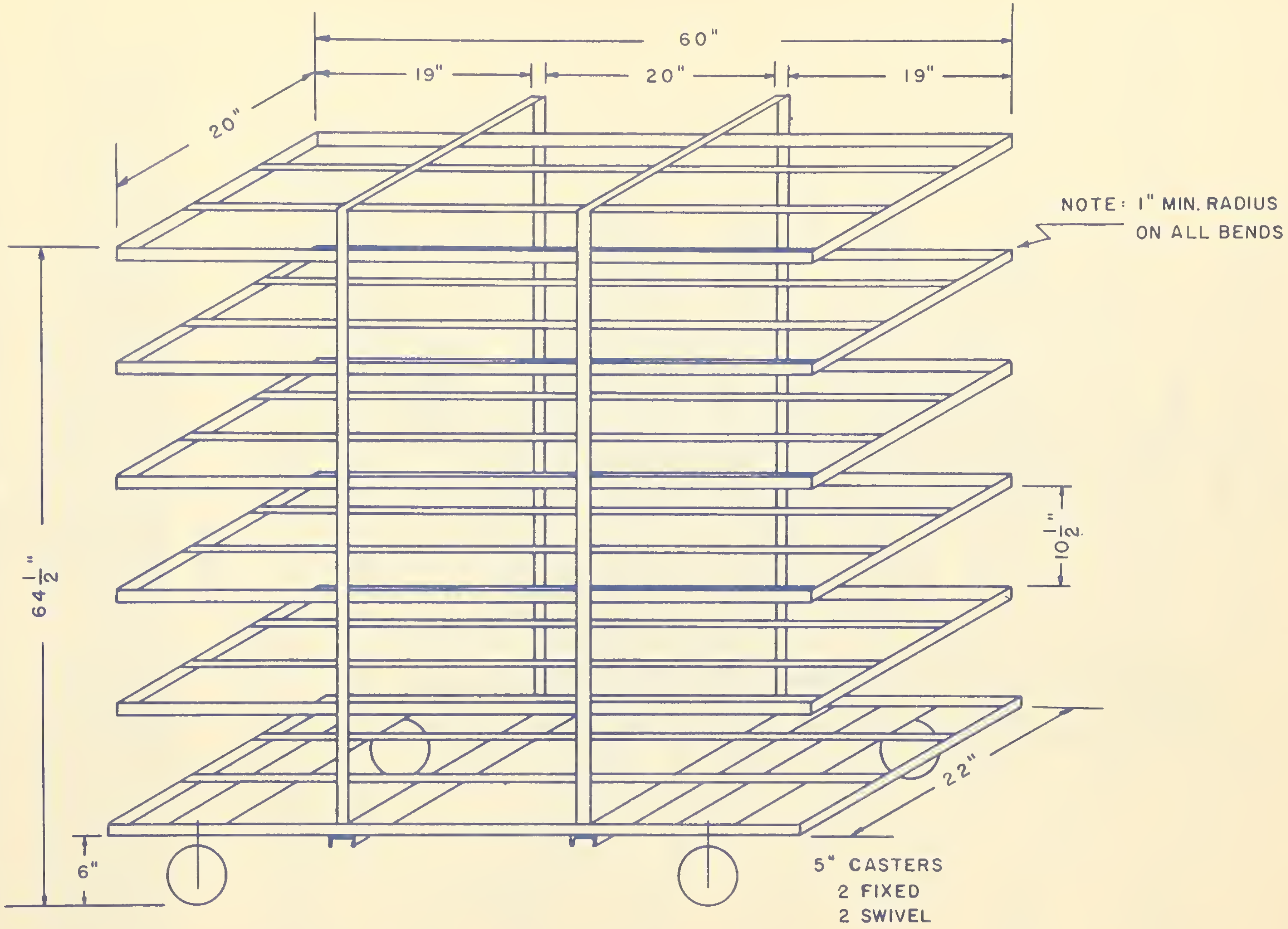
Figure 7.

included in figure 11 comprises two traying work stations combined into one piece of equipment. Test experience indicates that a single workplace (one half of the one shown) is adequate for bulk display departments with weekly sales volume up to about $5,000. The double workplace proved adequate for bulk display departments ranging up to $10,000 weekly volume.

Provisions should be made at workplaces for convenient storage of each size tray, tray collars, packaging material, and pricing equipment. One of the multiple tray carriers or a stationary tray storage rack is parked alongside each workplace to receive filled trays. In large volume departments or where



18 TRAY
CARRIER

(NOTE: THIS DRAWING SHOWS ONLY CONFIGURATION AND DIMENSION)

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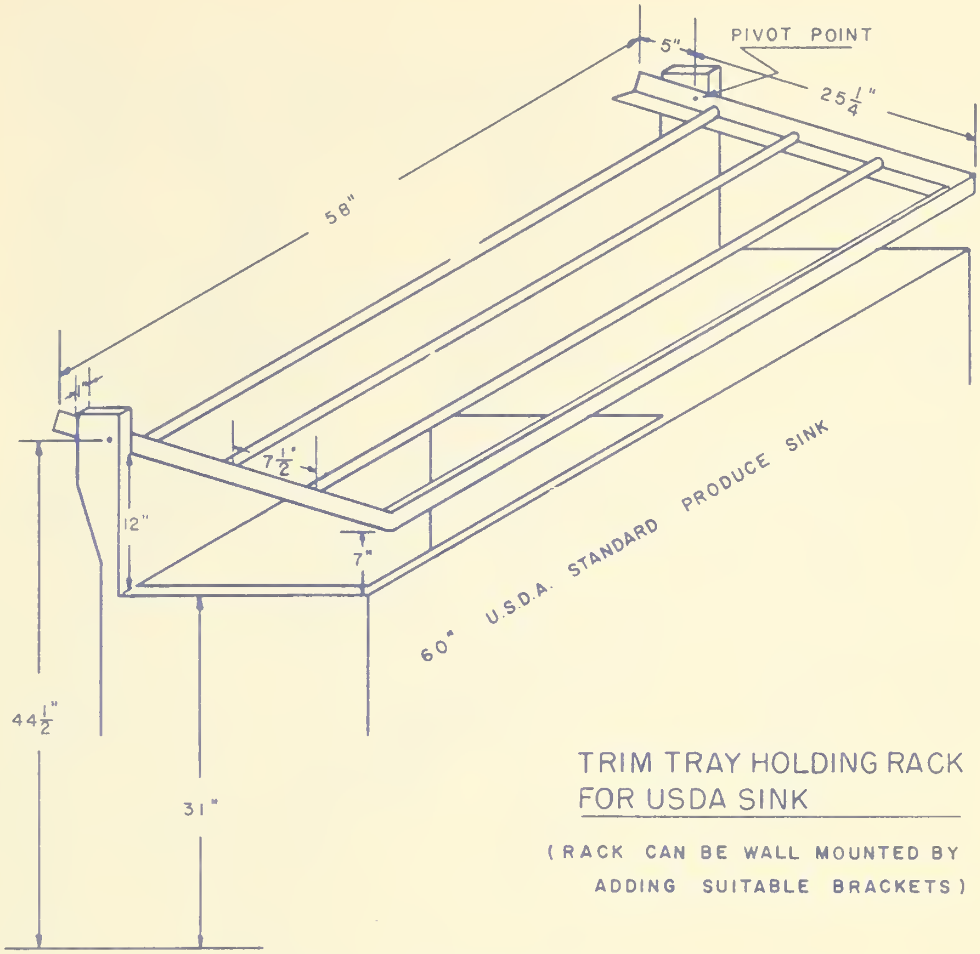
Figure 8.



TRIM TRAY HOLDING RACK
FOR USDA SINK

(RACK CAN BE WALL MOUNTED BY
ADDING SUITABLE BRACKETS)

(NOTE THIS DRAWING SHOWS ONLY CONFIGURATION AND DIMENSION)

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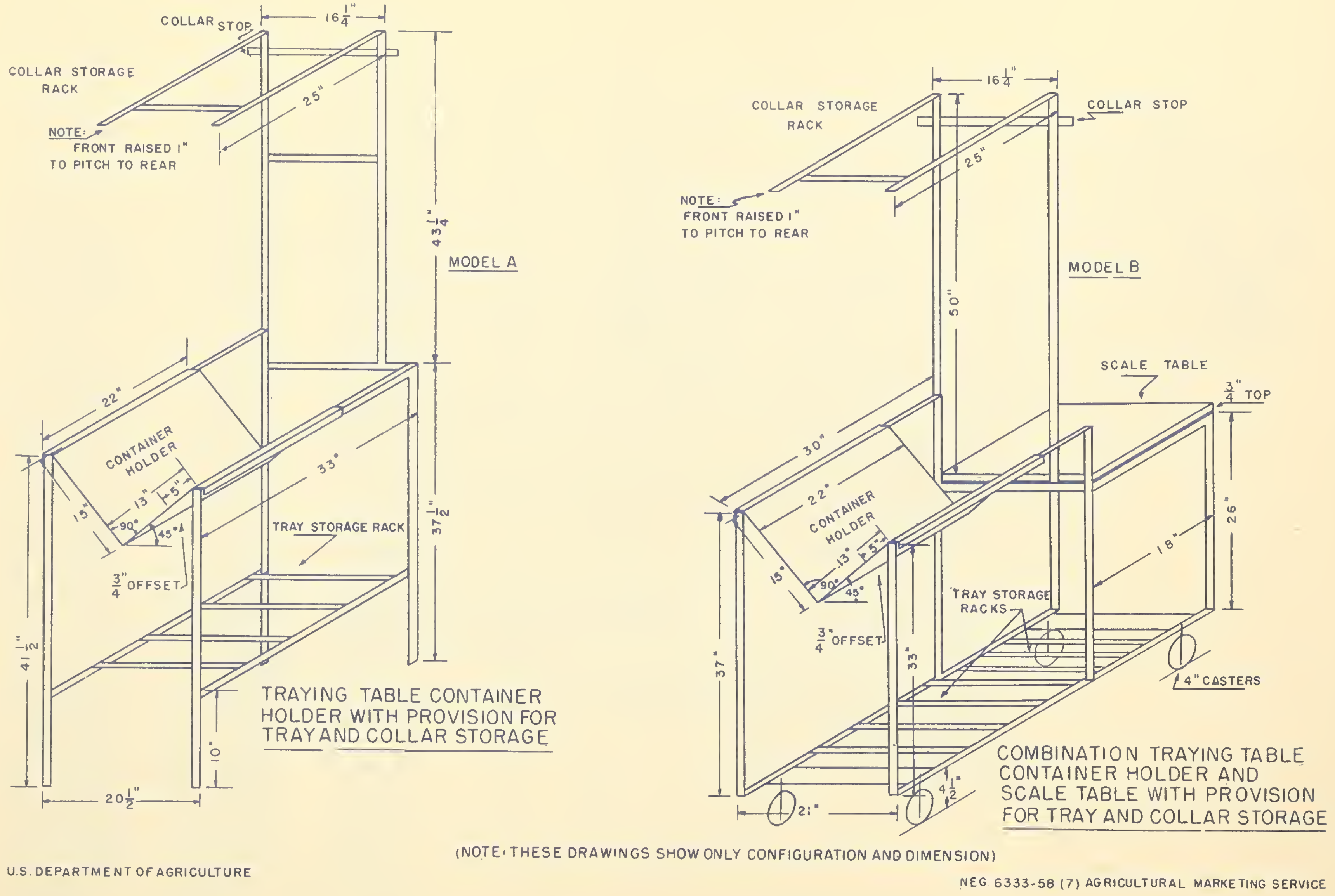
Figure 9.

traying was done considerably in advance of the time the trayed merchandise was displayed, it proved advantageous to have sufficient rack space so that hardware items could be stored separately from those that were held in refrigerated storage.

The transfer of merchandise from master shipping containers into trays is the primary operation accomplished at this workplace. The method used in making the transfer will depend upon the characteristics of the item and the way it is to be merchandised. In test stores a limited amount of pricing and packaging was done at this work station.

Dumping merchandise from shipping cases into trays is the fastest method of loading and should be used whenever practical. The tray collar shown in figure 12 was developed to facilitate the loading of trays by dumping or by using double handfuls. The collar was designed to nest inside the metal bun pan and is held in place by the rim of the pan. It prevents spillage from the


COLLAR STOP
16 1/4"
COLLAR STORAGE RACK
NOTE: FRONT RAISED 1" TO PITCH TO REAR
25"
43 1/4"
MODEL A
22"
CONTAINER HOLDER
13"
5"
15"
90°
45°
3/4" OFFSET
33"
TRAY STORAGE RACK
37 1/2"
41 1/2"
10"
20 1/2"
TRAYING TABLE CONTAINER HOLDER WITH PROVISION FOR TRAY AND COLLAR STORAGE
16 1/4"
COLLAR STORAGE RACK
COLLAR STOP
NOTE: FRONT RAISED 1" TO PITCH TO REAR
25"
MODEL B
50"
SCALE TABLE
3/4" TOP
30"
22"
CONTAINER HOLDER
13"
5"
15"
90°
45°
3/4" OFFSET
18"
26"
TRAY STORAGE RACKS
37"
33"
4" CASTERS
4 1/2"
21"
COMBINATION TRAYING TABLE CONTAINER HOLDER AND SCALE TABLE WITH PROVISION FOR TRAY AND COLLAR STORAGE
(NOTE: THESE DRAWINGS SHOW ONLY CONFIGURATION AND DIMENSION)
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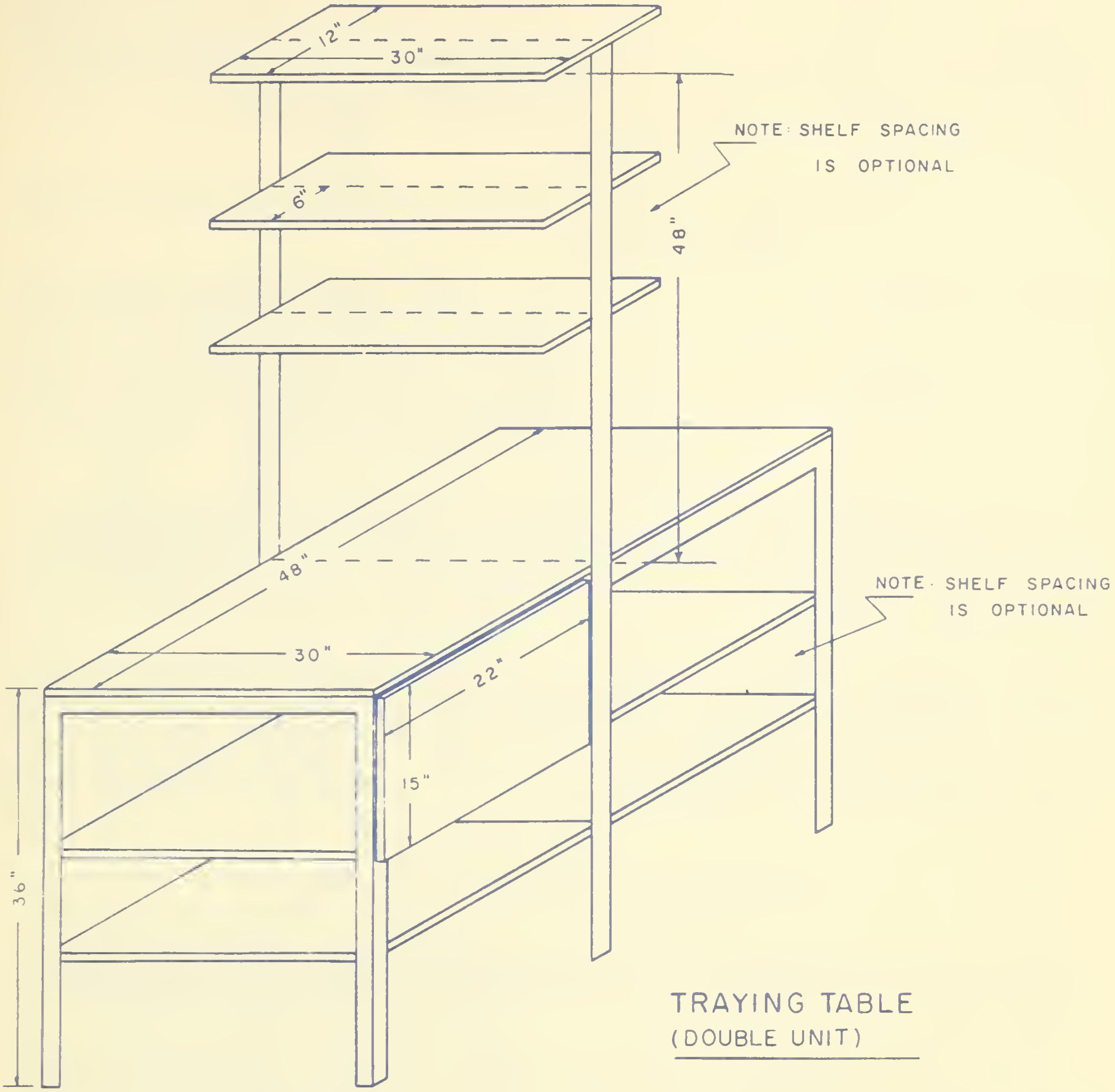
NEG. 6333-58 (7) AGRICULTURAL MARKETING SERVICE

Figure 10.


12"
30"
6"
NOTE: SHELF SPACING IS OPTIONAL
48"
48"
30"
22"
15"
36"
NOTE: SHELF SPACING IS OPTIONAL
TRAYING TABLE
(DOUBLE UNIT)

(NOTE: THIS DRAWING SHOWS ONLY CONFIGURATION AND DIMENSIONS)

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Figure 11.

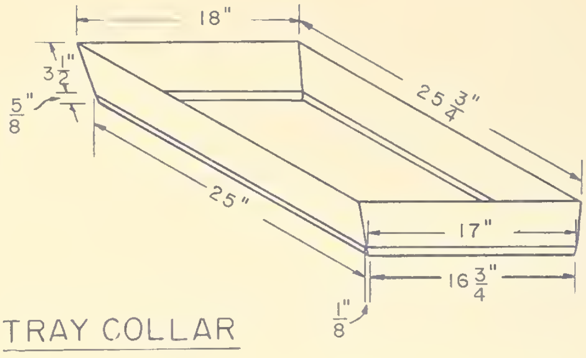

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Figure 12.

tray until the tray is placed on the counter. The use of a collar to increase the depth of the tray also makes it possible to load a full hamper of green beans, peas, spinach, and other bulky items into a tray.

PORTABLE DISPLAY BINS FOR LARGE VOLUME ITEMS

Some large volume and bulky produce items cannot be handled efficiently with the regular tray equipment. For these, certain special pieces of equipment and alternative work methods were employed along with the tray equipment used in test stores.

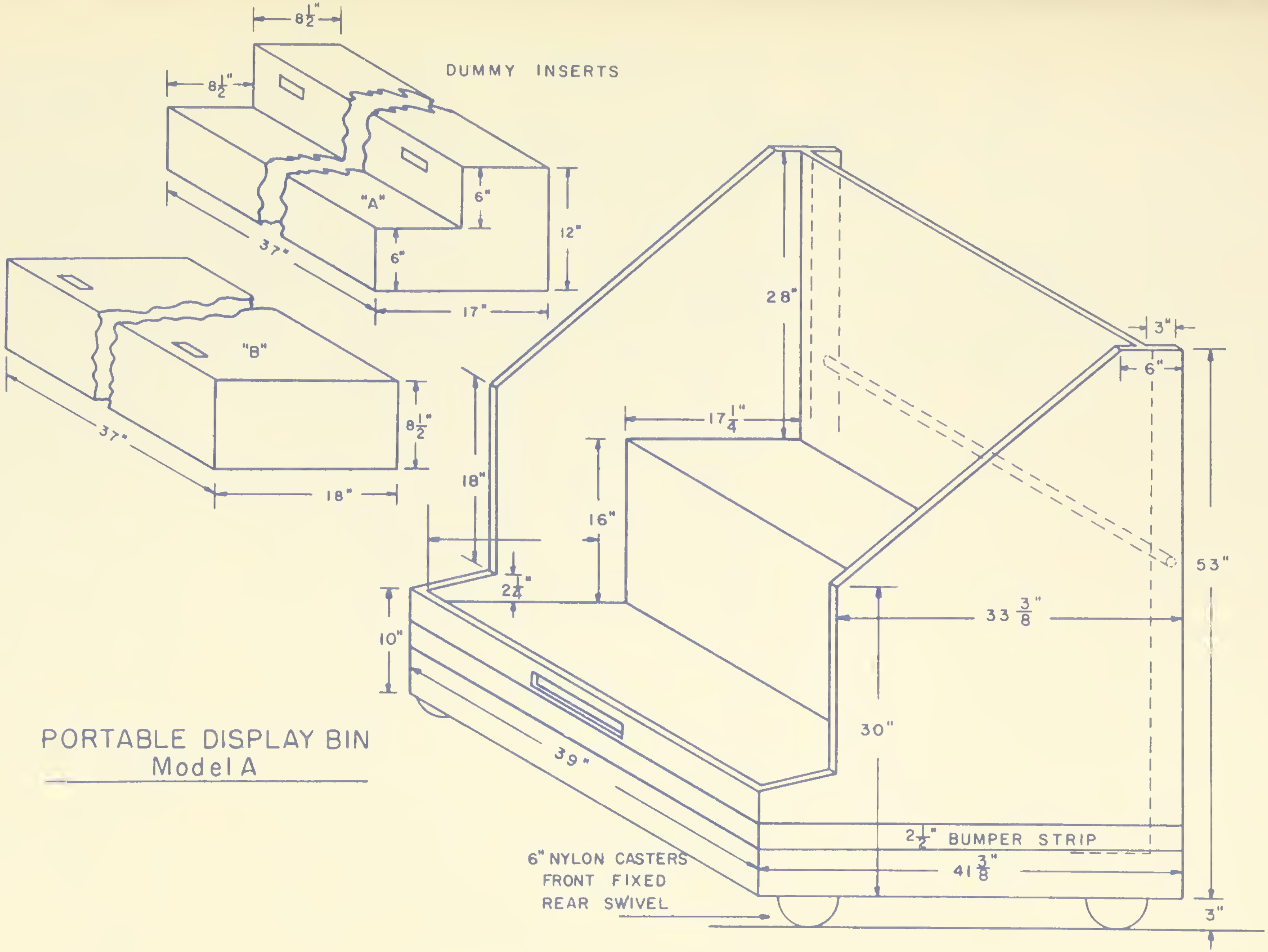
Several supermarket firms are currently using portable bins for handling and displaying large-volume bagged merchandise. Two styles of portable bins that were constructed and used in AMS research are shown in figures 13 and 14. Dimensions of the bins can be altered according to the volume of the department and the space available.

The bins are used, as are trays, to reduce product handling and to prepare displays in advance. They are loaded in the back room and rolled into display position on the sales floor as needed. If 6 bins are regularly used on the floor for displaying merchandise, 3 or more extra bins should be provided so that bin loading can be accomplished as part of receiving or as items are bagged, if bagging work is done in the store.

CONSIDERATIONS IN THE USE OF EQUIPMENT

The use of a counter layout sheet scaled to the size of the trays and counters employed was found to be a valuable aid in planning the arrangement of displays and in guiding the advance preparations of new merchandise.

During the pre-opening morning work period it saved time to have all employees in the department concentrate first on completing the traying of items needed for setup and loading the 18-tray carriers. Preparation work was completed in the back room before beginning display work on the sales floor. Trim merchandise and the out-of-stock items on the produce delivery schedule were always prepared in the morning prior to store opening; but the loading of trays with other setup items was usually begun the previous afternoon, often by part-time workers. Completing much of the advance traying work during afternoon and evening hours is the principal means for achieving a better balanced workload through the use of tray display. Proper scheduling of the traying work reduces the number of pre-opening man-hours needed in order to have the counters fully stocked by the time the store opens.



(NOTE: THIS DRAWING SHOWS ONLY CONFIGURATION AND DIMENSIONS)

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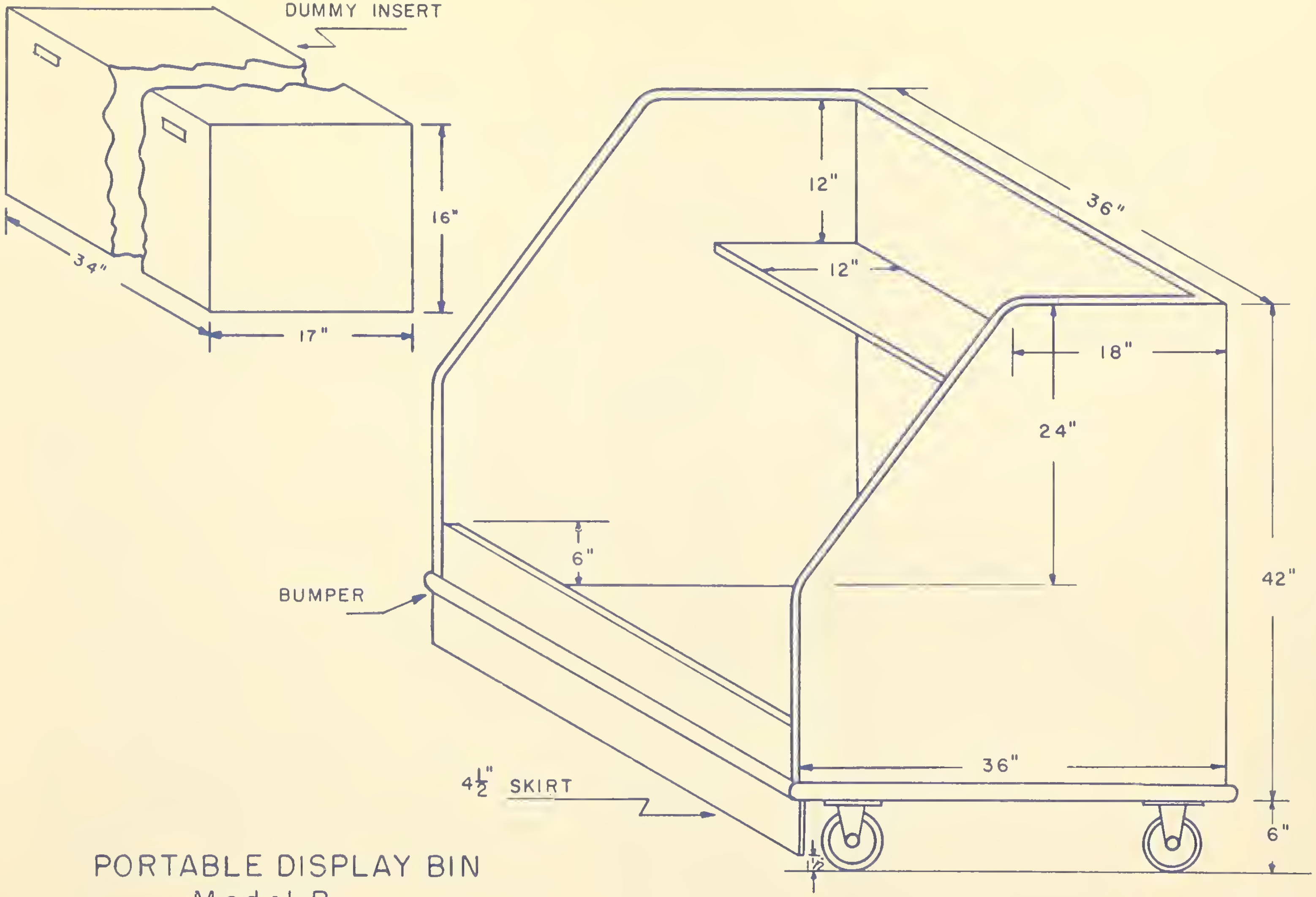
Figure 13.



PORTABLE DISPLAY BIN
Model B

5" DIA. WHEELS
SWIVEL REAR
FIXED FRONT

(NOTE: THIS DRAWING SHOWS ONLY CONFIGURATION AND DIMENSION)

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Figure 14.

The time to take down the display each evening was reduced substantially by the use of the trays and large capacity carriers. Before closing time merchandise was consolidated by minimizing the number of partially filled trays. After closing time the items were removed from the counter by first collecting and refrigerating all items that needed to be reworked before displaying. Then, all items that needed only to be kept cool during the night were removed. These were readily displayed again the next morning with a minimum of re-sorting.

The majority of the produce items in test stores were displayed in two trays. Having the item display split between two trays offers considerable flexibility in restocking and rotation of counter merchandise. One or two new tray loads can be inserted depending upon the rate of sale, time of day, and condition of older merchandise.

In the routine restocking of displays, one new tray per time was usually added. To do this the front tray was removed from the counter and the rear tray pulled forward. A new tray load was transferred from the carrier into the rear space. Old merchandise remaining on the tray was removed, culled, and placed on the top of the display.

The installation of a tray system should be regarded as a secondary refinement in upgrading the efficiency of a produce department. In all tray test stores certain essential basic improvements in receiving, storing, processing, packaging, and pricing of produce, in accordance with AMS research findings, were either installed before or concurrently with the introduction of tray equipment and work methods. These basic improvements are referred to as the "Phase I" program for improving produce department operations. The tray system is referred to as the "Phase II" program. Results of experimental work to date strongly suggest that in most produce departments the Phase I program, properly followed, will usually account for a substantial part of the total improvement to be realized from a combined Phase I and Phase II installation.

The tray display system can be adapted to either the bulk or prepack types of retail produce operation. However, it appears that the time savings and merchandising advantages to be derived from this system of operation will usually be greater in the bulk department. This is due to the fact that tray handling units serve to accomplish for the bulk operation some of the more desirable operational advantages of prepackaging. Trays permit the preparation of bulk merchandise in advance of the time of sale. Pieces are handled in large unit loads rather than individually. Shipping containers and the attendant work of grading, processing, and pricing of merchandise as it is taken from the containers is kept out of the display area.

The physical characteristics of some produce departments may prohibit the successful use of trays. Differences in floor levels between storage, preparation, and sales areas will restrict the use of tray carriers and eliminate much of the advantage of tray display. Substantial differences in the widths of display counters within a department or the way in which the counters are constructed may require an excessive expenditure for alterations in order to adapt existing fixtures for the use of a compatible set of trays. A two-floor operation without an elevator capable of accommodating a tray carrier poses the problem of either installing an elevator or devising an alternative means of transporting trays between the preparation and sales area. The dimensions of cooler doors, passageways, and space for equipment storage as well as the peculiarities of the store's produce merchandising program must all be evaluated in determining whether the use of trays will be possible and practical in a given situation.

Available information indicates that the cost of essential equipment for making an effective installation of tray units in most stores would range from between $1,200 and $4,000. Many stores will find it necessary to make an additional expenditure for structural modifications. The appreciable capital expense involved emphasizes the importance of making a thorough analysis and evaluation of the produce department before a decision is made.

Toothman, James Sterling, 1915–

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